



UNITED STATES NAVY

MEDICAL NEWS LETTER

Editor - Captain L. B. Marshall, MC, USN (RET)

Vol. 26

Friday, 4 November 1955

No. 9

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Graduate Training in Navy Hospitals

1 Applications for assignment to residency training duty are desired from Regular medical officers and those Reserve medical officers who have completed their obligated service under the Universal Military Training and Service Act, as amended. The chart below lists those Navy hospitals which currently have vacancies at the first year level, and the specialties in which these vacancies exist. Vacancies are also available at other than first year levels. Information concerning non-first year appointments may be obtained by correspondence addressed to the Chief of the Bureau of Medicine and Surgery.

2 Applications for the below first year level appointments will be accepted from now until 30 January 1956.

3 A limited number of vacancies in General Surgery are now available to qualified Reserve officers.

4 Letters of application for first year assignments should be forwarded via official channels to the Chief of the Bureau of Medicine and Surgery, and should include an obligated service agreement prepared in accordance with the provisions of BuMed Instruction 1520.7.

	Bethesda, Md.	Chelsea, Mass.	Oakland, Calif.	Philadelphia, Pa.	Portsmouth, Va.	San Diego, Calif.	St. Albans, N.Y.
Anesthesia	x	x	x				
General Practice		x			x		
Internal Medicine		x		x			x
Neurology	x			x			
Orthopedics	x	x			x		
Otolaryngology	x			x		x	
Pathology	x		x				x
Pediatrics			x				
Psychiatry	x		x	x			
Radiology	x	x		x		x	
Surgery					x	x	x
Urology							x
Cardio-Vascular Diseases	x						

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SPECIAL NOTICE

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Editor

(detach here)

Chief, Bureau of Medicine and Surgery _____
Navy Department, Potomac Annex _____ (date)
Washington 25, D. C.

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be nor susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Notice

Due to the critical shortage of medical officers, the Chief, Bureau of Medicine and Surgery, has recommended, and the Chief of Naval Personnel has concurred, that Reserve medical officers now on active duty who desire to submit requests for extension of their active duty for a period of three months or more will be given favorable consideration.

* * * * *

Development and Construction of Cardioscope
and Cardiac Stimulator, Using Standard
Navy Supply Table Items

Oscilloscopes can be used profitably in many aspects of clinical as well as research medicine. Utilization of these instruments is limited by virtue of the expense of existing commercially available models or by the relatively advanced electronics involved in the construction of instruments suitable for recording biological phenomenon. A partial solution of this problem of expense and electronic knowledge is offered.

The problem of constructing a Cardioscope was attacked along the following lines: The Oscilloscope should be of a standard design and known construction. The Dumont Model 208 or 208-B was selected, for it is widely used by both civilian and military. The conversion of certain existing Oscilloscopes is cheaper and requires less time than to design and/or build an Oscilloscope for this purpose.

A conversion unit was designed so that the electrocardiogram can be viewed on the Oscilloscope at an acceptable, controlable, and easy to analyze rate. The conversion unit accomplishes two major things:

1 Provides controlable horizontal sweep on the Oscilloscope at a rate sufficient to view cardiac action.

2 Provides a means of connecting the modified Oscilloscope to the electrocardiograph machine without disturbing the normal electrocardiogram, either when recorded on the electrocardiograph machine or when presented on the modified Oscilloscope.

If explosion proof is desired for use in operating room, the entire modified Oscilloscope can be placed in an air tight metal container with cables for energizing the cardioscope and to feed the electrocardiogram intelligence from the electrocardiograph machine to the modified Oscilloscope. If explosion proof is not required, the components required to fulfill items 1 and 2 may be placed in any reasonable container and the size should not exceed approximately one-third the total size of a normal commercial Oscilloscope.

The total cost of the conversion unit is approximately \$60.00. If purchased, approximate cost of the Oscilloscope, \$300.00 new, \$150.00 used. However, all items concerned are available through standard Navy supply systems.

The Oscilloscope, when modified and used with the electrocardiograph machine, then becomes a "Cardioscope." The device has been successfully used by both the surgeon and anesthetist as a continuous monitor of cardiac action. If desired, a permanent record can be made with the electrocardiograph machine while viewing any cardiac phase on the cardioscope. A foot switch has been devised, enabling the viewer to operate the electrocardiogram at a remote location. The cardioscope has also been of value where classroom instruction in cardiology and electrocardiography has been in progress.

The uses of this device are many, ranging from patients with Stokes-Adams syncope to the facilitation of recording a wide variety of biological phenomena. However, such is not the primary purpose of this work. It is the desire that this development will aid in bringing the Oscilloscope into a proper place in medicine to that of a very facile recorder of many uses.

The problem of a cardiac stimulator has been attacked with the object of producing a workable device at a minimum of cost. A number of circuits have been devised with varying results from each.

A completed model, involving a blocking Oscillator and utilizing component parts available through standard Navy supply systems, has been developed. The circuit is not complex and can be used with a minimum of electronic background.

The rate of stimulation is controlable from approximately 30-150 pulses per minute. The wave shape at the output from the stimulator is

basically rectangular and is variable in amplitude. Rate of pulsing can be observed by the use of a bulb included as a part of the stimulator.

Output from the stimulator is applied to the body by use of two 21-gauge syringe needles inserted subcutaneously. Connection is made to the needles by the use of electronic connectors and a cable feeding energy from the stimulator.

The stimulator lends itself very well for use with the Cardioscope, i. e., it is possible to continuously monitor cardiac action with or without stimulation.

(Captain Victor G. Colvin, MC USN, Chief of Medicine, and Lieutenant George Sutton, MC USNR, Head of the Heart Station, both of the Great Lakes Naval Hospital, supervised the ingenious conversion which was carried out by Chief Electronics Technician Wayne E. Connor, USN.)

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Pyogenic Infections

The therapy of acute and chronic pyogenic infections of bones and joints is still beset with inadequate results, due in many instances to frequently excessive dependence upon antibiotic drugs as a sole agent in the treatment of these lesions. It is true that, as a result of the use of the various antibiotics during the past decade, deaths from acute pyogenic infections have been diminished almost to the vanishing point and morbidity has been strikingly reduced. Nevertheless, there are a number of poor results that warrant attention and study.

With respect to the therapy of pyogenic infections, it is fundamental that one keep uppermost in mind the well established concept that the acute and at times the chronic lesion, presents a complicated symptom complex which is the result of a varying proportion of the two components of the disease, namely, the systemic disease incidental to bacteremia and toxemia and the local disease, be it suppurative arthritis, an osteomyelitic lesion or even a soft tissue abscess. Sufficient evidence exists that the systemic component of the disease can be obviated, provided the offending micro-organism is sensitive to a properly chosen and adequately administered antibiotic, and the toxemia is not overwhelming because pre-formed toxins are not influenced by antibiotics and must, therefore, be dealt with by the patient's defensive mechanisms. In contrast to the foregoing comments, it is just as clear that under similar circumstances the local component of the disease, if it is acute, may or may not be eliminated; and if it is chronic, antibiotic therapy alone will rarely if ever eradicate the disease. This variation in response to antibiotic therapy is due to the character of the pyogenic lesion.

The acute hematogenous osteomyelitic lesion arises as a local inflammatory process during the course of a blood-borne, bacterial invasion and in response to the rapid multiplication of the micro-organisms and the production of exotoxins, leukocidins, hemolysins, and spreading factors, suppuration and abscess formation develop. A walling-off process sets in early in the form of peripheral thrombophlebitis and thromboarteritis, while the central area of the focus undergoes necrosis and suppuration. An additional important consideration in this process is that the abscess develops in rigid-walled surroundings and the resultant accumulation of pus under pressure aids in the growth of the lesion by interference with the blood supply in the adjacent metaphyseal and subperiosteal areas.

When these phenomena—peripheral thromboarteritis, thrombophlebitis, and the avascularity arising from the pressure of the growing abscess—are viewed in the light of antibiotic therapy, and for that matter, in the light of chemotherapy or serotherapy, it becomes readily evident that these therapies must fail because of the inability of the blood stream to deliver the therapeutic agents into the focus of disease so as to make them effective. In view of these considerations, the mere administration of antibiotics, no matter how well chosen or how well administered, will not be effective in the eradication of the lesion once it has become sufficiently well developed. On the other hand, very early administration of antibiotics before the full development of the aforescribed phenomena has been reached, will result in the prevention or abortion of these lesions, thus, accounting for the present-day decrease in the frequency of acute hematogenous lesions and their subsidence during the early stages of the disease.

Therefore, it follows that rational treatment of the acute hematogenous lesion should provide for the administration of a suitable antibiotic at the earliest possible moment. Subsidence of the systemic manifestations of the disease should not lull the medical attendant into the belief that the local lesion also is being effectively overcome unless the local signs and symptoms likewise subside. Persistence of local pain, tenderness, and swelling, notwithstanding the subsidence of temperature elevation and improvement of the general conditions, warrant surgical intervention in a matter of days after the onset of the lesion rather than weeks.

One should not await roentgenographic changes before surgical intervention is undertaken in conjunction with antibiotic therapy. The operation should be performed under tourniquet control when possible and should consist of an incision along anatomic planes and decompression of the bone lesion regardless of whether or not pus is encountered in the soft tissues or subperiosteally. Excessive decortication or curetttement of the focus should not be done. The focus should be thoroughly flooded with physiologic solution of sodium chloride containing a high concentration of the antibiotic as it is closed firmly with several layers of sutures, without

any drainage whatsoever. Immobilization is obtained by the use of a compression bandage of sheet wadding, flannel, and adhesive tape. The wound is not disturbed until the tenth postoperative day, at which time it will be found to have healed per primam. Antibiotic therapy is usually continued for a minimum of four weeks after the operation.

Postoperative roentgen studies will reveal the gradual obliteration of the surgically created defect with diminishing evidence of disease activity. Eventually, the bone will present a completely normal appearance. The clinical recovery is just as thorough. Only under such circumstances can one feel assured that the lesion has been eradicated.

The limitations of this article do not permit the presentation of statistics or case reports. Suffice it to say that, since 1944, when the author resorted to the use of primary closure without drainage of extensively saucerized wounds under antibiotic control, he has had a high proportion of cases of healing by primary intention—often under trying circumstances—of a large number of osteomyelitic lesions. Many of these lesions were extensive; some were multiple and of long duration with histories of many recurrences and exacerbations. Most commonly, failure of healing by primary intention was due to inadequate excision of the bone or soft tissue in proportion to the nature and extent of the lesion or inadequacy of the surgical technique. Many of these failures were anticipated because of the probable impossibility of a sufficiently thorough excision. These procedures were, nevertheless, undertaken with the hope that an amputation could be avoided. Other failures of healing by primary intention arose from a breakdown of the skin coverage. Subsequent skin plastic procedures of skin grafts were, therefore, necessary to bring about the desired results.

All of these cases have been kept under close follow-up observation. The author is, therefore, in a position to state that the rate of recurrence is much lower than that reported as following other methods of treatment. Some recurrences were anticipated because of the inadequacies of the surgical procedures. Nevertheless, the over-all results are so gratifying that the surgical maxim, "once osteomyelitis, always osteomyelitis," may eventually become a thing of the past.

The therapy of acute and chronic pyogenic infections of joints has much in common with the therapy of acute and chronic osteomyelitis. The variations in the therapeutic approach are dependent upon the variations in the pathomechanical nature of these lesions. Acute, hematogenous pyogenic arthritis is more amenable to antibiotic therapy without the surgical approach because the developing abscess does not have the rigid confines of the bony walls observed in its osteomyelitic analogue, and the threat of rapid spread of the lesion because of aseptic necrosis incidental to obliteration of blood supply is nonexistent. Furthermore, the absorptive capacities of joint synovial tissues and their blood stream communications are much more extensive than in the osteomyelitic lesion. In view

of these variations, early systemic administration of a well-chosen antibiotic and local therapy by means of repeated aspirations of the joint and instillations of physiologic solution of sodium chloride, containing a high concentration of the antibiotic, will resolve the lesion. Failure of such resolution, as indicated by the persistent presence of the offending micro-organisms within the aspirated fluid, will necessitate the surgical excision of all infected tissues and the abscess wall. This should not be deferred unduly lest joint function be lost. It should be performed under a systemic as well as a local antibiotic "umbrella," and the surgical wound should be closed without drainage.

The author outlines the rationale of the therapy of acute, postacute, and chronic pyogenic lesions of bones and joints by the use of antibiotics, surgical intervention, and primary closure of the surgically formed wounds based upon the pathomechanics of the various lesions. Great emphasis is placed upon the effectiveness of a properly chosen antibiotic during the early phases of the lesion before the walling-off process has been fully established. Greater emphasis is placed upon the ineffectiveness of a properly chosen antibiotic when used as the sole agent of therapy in the presence of a fully developed acute or chronic pyogenic lesion by reason of the walling-off process which prevents the delivery of the drug via the blood stream into the disease focus. Stress is also placed upon prevention of the exogenous type of pyogenic lesions of bones and joints by timely use of the antibiotics in conjunction with various surgical procedures. (Buchman, J., The Therapy of Pyogenic Infections of Bones and Joints: J. Internat. Coll. Surgeons, XXIV: 300-307, September 1955)

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Complications and Postoperative Care after Tracheotomy

Because there has been an increase in the indications for tracheotomy, objective analysis of the available facts concerning complications should be made. Tracheotomy is employed in a large number of conditions; and while the question of its necessity in such a varied list may be raised, it has proved to be the difference between survival and death in many cases. Procrastination and delay in performing the operation is hazardous to the patient and leads to more serious complications than any that may develop from the operation itself. In some instances, it has been done without sufficient reason and the patient probably would have recovered anyway, although it may have hastened this development. In still other cases, nothing that one could do would relieve or cure the patient, and in this type of case no benefit resulted.

It is by no means clear just how much the trauma and short-circuiting of the air current by tracheotomy with its indwelling tube affects inflammatory exudate and causes dryness and crusting of the tracheobronchial secretions. The drying effect can be overcome to a large extent by proper humidification of the inspired air, and the crusting can be minimized by judicious suction after irrigation with saline solution. The use of detergent agents and proteolytic enzymes provides some help, but to a lower degree.

Tracheotomy is a relatively simple procedure and the complications that develop are generally due to faulty surgical technique. Although the risks of the operative procedure are negligible, the postoperative sequelae may produce disability with subsequent long periods of treatment before recovery.

Severe and critical hemorrhage after tracheotomy has been reported but this complication is rarely encountered except from actual tumor invasion of the trachea with erosion into a large vessel. In infants, the trachea is soft and of such small caliber that unguarded incision of the anterior wall may result in cutting the posterior tracheal wall. Atelectasis and post-tracheotomy pneumonitis can be prevented by keeping the airway free from secretion while simultaneous antibiotic therapy reduces the morbidity and mortality.

The most frequent complications are mediastinal emphysema and pneumothorax. While these occur often, they are usually not present to a degree to cause concern. Pneumothorax is probably commoner than is generally believed and is found only on routine chest roentgenograms in many instances. Several authorities have explained the mediastinal emphysema on the basis of the indrawing of air into the mediastinum after incision of the pretracheal fascia by the high negative intrathoracic pressure from excessive respiratory efforts.

The most difficult complication to overcome and one which can be most easily prevented is that of stenosis at the site of the tracheotomy. When this occurs, there is delay in decannulation. It is particularly prone to occur in infants and young children whose tracheal rings are soft and can be easily compressed. After stenosis develops, it is often necessary to dilate the trachea for a long period of time and remove granulations from the airway before the patient can be decannulated. In other instances, the child must grow up around the tracheotomy tube so that the lumen is increased sufficiently to overcome the stenosis.

The proper size of the tracheotomy tube for the size of the patient is an important consideration. It should rest comfortably in the trachea and not occupy the entire lumen. Granulation tissue oftentimes forms at the site of the opening but this is more likely to occur when a large tube is inserted in the trachea rather than a tube of appropriate size for the

patient. At times, granulations on the posterior tracheal wall form from trauma of the distal end of the tracheotomy tube.

The after-care of tracheotomized patients needs to be clarified for both the nursing and the general medical profession. The establishment of a tracheotomy is only a means to an end and the operation itself does not cure the patient. It affords an accessory airway which must be kept free of secretion in order to function and provides a means of entering the lower respiratory tract to remove obstruction when it develops. It may seem elementary to mention the fact of daily changing of the tracheotomy tube. All too frequently, infants are admitted to the hospital with a tracheotomy tube in place which has not been changed for 10 to 14 days.

When visiting a tracheotomized case, it is not infrequent to find the youngster in marked dyspnea, and when the patient is examined, crusting around the tracheotomy tube, with no air getting in or out of the lungs, is found. Simple cleansing of the inner cannula at stated intervals will relieve this condition. Generally, nurses are rather timid in aspirating a patient with a tracheotomy and introduce the aspirator only to the end of the tracheotomy tube. While this cleans the tube, it does not aid in clearing the lower respiratory passages. A small soft-rubber catheter introduced down to the carina and commonly into one or the other or both main bronchi is needed in many instances. It should be mentioned that frequently catheter aspiration clears only one bronchus, usually the right, because the flexible tube follows the straight route and aspiration through the bronchoscope under direct vision must be used in addition. This has been particularly evident in postoperative tracheotomized thoracic surgical cases when bronchoscopic examination revealed retention of secretion in one or the other bronchus immediately after thorough catheter suction via tracheotomy had been carried out.

Crusting develops frequently, making removal of secretions difficult, but it can be facilitated by the introduction of several cubic centimeters of isotonic saline solution into the trachea several seconds before aspiration. Proper humidification and nebulization of the inspired moisture minimize this complication. Oxygen itself has a drying effect upon the mucosa of the tracheobronchial tree and when employed should be used with some form of humidification to overcome the dryness.

Considering the advantages and disadvantages of tracheotomy, the former far outweigh the latter. When it is realized that the complications arise from faulty technique in the majority of cases, it would seem that this could be eliminated altogether, thus allowing for greater usefulness of this important operation. (Putney, F. J., Complications and Postoperative Care after Tracheotomy: Arch. Otolaryng., 62: 272-276, September 1955)

* * * * *

Subdiaphragmatic Fundusectomy in Gastric Surgery

The technique for subdiaphragmatic fundusectomy has been worked out by the authors for reasons which are set out in this article. This is a method of resection of the upper portion of the stomach by which a removal of part of the fundus and a subdiaphragmatic union of the intra-abdominal stump of the esophagus with the remainder of the stomach can be carried out without much risk.

The indications for fundusectomy, in the opinion of the authors, are all isolated pathologic processes in the upper third of the stomach. The operation is indicated, therefore, principally for the radical treatment of the subcardiac, large, callous, hemorrhagic and possibly malignant ulcers and for carcinomas of the fundus region which do not involve the cardia and the left gastric artery.

Pre-eminently suitable for fundusectomy are the localized carcinomas situated in the region of the greater curvature of the fundus because the lymph drainage of this region goes to the hilum of the spleen. The spleen as well as parts of the tail of the pancreas, in certain circumstances may be removed without difficulty during fundusectomy. For the carcinomas which are situated on the lesser curvature of the fundus, fundusectomy may be employed only in exceptional cases because the regional metastasis that occurs in the lymph drainage area of the celiac artery is generally more extensive and, thus, requires an abdominothoracic resection.

For the success of the subdiaphragmatic fundusectomy, two technical requirements must be absolutely observed.

1 Preservation of the esophageal branches of the left gastric artery which together with the ramifications of the inferior phrenic artery serve the intra-abdominal esophagus stump. This preservation is of the utmost importance for the success of the high subdiaphragmatic anastomosis which is performed.

2 The craniocaudal direction of resection by means of which at the beginning of the operation it is possible to judge with confidence the extent of the pathologic process. By means of biopsy specimens of the intra-abdominal stump and the left gastric artery at the division by the esophageal branches, it is decided whether a partial resection of the upper part of the stomach by fundusectomy is advisable.

By means of the technique of subdiaphragmatic fundusectomy, a gap has been closed in the practice of gastric surgery. By adhering to the resection technique given in this article, esophagogastrostomy which has for long been feared in numerous surgical centers can be carried out from

a purely abdominal approach without too great a risk. Therefore, it is possible to remove isolated pathologic processes in the fundus region of the stomach without removing the whole stomach as has previously been usual.

Total gastrectomy is such a severely mutilating intervention that it should be used only in cases of dire necessity. The choice of operative technique should be made in every individual case so that the optimal degree of radical resection is combined with the least possible loss of gastric function.

The development of an operative technique for partial resection of the upper section of the stomach is now one of the most important problems of gastric surgery. The development of subdiaphragmatic fundusectomy has made a contribution in this respect; the technique is described by the authors.

Follow-up studies of iron absorption after fundusectomy have shown that in both experimental animals and human beings dysfunction of iron absorption does not appear. This is in contrast to the two-thirds resection operation. Fundusectomy is superior to the two-thirds resection operation in respect of postoperative iron absorption function.

The proteolytic capacity of the fundusectomized stomach is not significantly limited. This is increased by the addition of the unaltered tryptic capacity of the duodenal juice so that an undisturbed total proteolytic action remains.

According to the authors' experience, fundusectomy is suitable for the removal of local, limited neoplasms in the region of the fundus. It is, above all, recommended for the radical treatment of subcardiac callous ulcers which are suspected of malignancy. (Holle, F., Heinrich, G., Subdiaphragmatic Fundusectomy in Gastric Surgery: Surg. Gynec. & Obst., 101: 385-394, October 1955)

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Primary Reticulum-Cell Sarcoma of Bone

Primary reticulum-cell sarcoma of bone is a malignant tumor histologically indistinguishable from reticulum-cell sarcoma arising in other regions of the body. It originates at a single site in bone and, when metastasis occurs, it is usually by way of the lymphatics. Pain and swelling are the chief symptoms, and characteristically there is lack of constitutional reaction. The prognosis is relatively good, the five-year survival rate approaching 50% following operation or proper irradiation. The importance of distinguishing between this tumor and other similar but more malignant conditions, such as osteogenic sarcoma and Ewing's tumor, is apparent.

In 22 of 33 cases, the origin was in long bones, and in 14 of these, in the lower extremities. It should be noted that in the generalized form of reticulum-cell sarcoma involvement of long bones is uncommon. Whereas, the skull is a frequent site of metastasis in the generalized disease, the 3 cases of Strange and de Lorimier, as described, are the only ones reported in which the disease was primary in the skull. Primary lesions in the mandible, however, are not rare. Both primary and metastatic forms of reticulum-cell sarcoma are seen in the vertebrae and pelvis.

Twenty-five of the 33 patients were males, the male to female ratio being approximately 3 to 1. The youngest patient was 9 years of age and the oldest 67. The average age of all patients was 39.3 years. Fifty percent were 40 years of age or less; only 4 patients were less than 20. In comparison, it should be noted that the generalized form of reticulum-cell sarcoma has its peak incidence in the sixth decade of life, and that Ewing's tumor most commonly occurs in childhood and adolescence.

The chief symptoms were persistent pain and swelling, features common to the onset of any malignant bone tumor. Pain was present in all cases and with the exception of 2 cases was the initial symptom. Typically, the pain was intermittent at first, gradually becoming more severe and finally almost constant.

Swelling at the site of the lesion was observed in 85% of the 33 cases. No other notable symptoms were described with the exception of disability resulting from joint involvement by the tumor, or cord symptoms from collapse of a vertebra.

An important feature of the disease which has been emphasized by nearly all writers is the fact that general well-being of the patient is almost uniformly seen. This is in contradistinction to the chronic low-grade fever, fatigability, and loss of weight which are experienced by most patients with other types of malignant bone tumor, and by those with the generalized form of reticulum-cell sarcoma. This finding of well-being was noted in the majority of cases in the present series.

In order to obtain as accurate an evaluation as possible of the roentgen findings in primary reticulum-cell sarcoma, each roentgenogram was critically studied with regard to the following fundamental features: (1) location of the tumor in the involved bone, (2) destruction of bone, (3) reactive proliferation of bone, (4) cortical destruction, (5) cortical thickening, (6) periosteal reaction, (7) soft-tissue involvement, (8) soft-tissue calcification, and (9) pathologic fracture. The extent to which each of the foregoing changes (3 through 8) appeared on the roentgenograms was determined and expressed in one of the following terms: marked, moderate, minimal, or none. The roentgenologic features are illustrated.

From the analysis, it is apparent that primary reticulum-cell sarcoma may be located anywhere in a given bone, but when occurring in the lower extremity, is more likely than not to originate near the knee joint.

When seen in the upper extremity, the lesion frequently involves the proximal part of the humerus.

On the basis of this series of cases, destruction of bone appears to be the chief roentgen feature. While it may vary considerably in extent, it commonly has an irregular distribution, giving the bone a mottled, patchy appearance. About half the time one may expect to see reactive proliferation of bone, but this finding rarely overshadows the destructive component. Destruction of cortical bone is a nearly constant feature, but too, it is extremely variable in degree. Thickening of the cortex is seen in about one-fourth of the cases but is rarely extensive. Periosteal reaction occurs to a minimal or moderate degree in about half the cases and occasionally is a striking feature. Approximately three-fourths of the patients manifest soft-tissue involvement roentgenographically, and one-fifth of these have evidence of calcific changes in the periosseous component. Pathologic fractures are of frequent occurrence.

While the roentgenologic appearance of this tumor varies to such an extent that it may not be regarded as characteristic, the radiologist frequently may suspect the diagnosis of reticulum-cell sarcoma and suggest it to the clinician. He must, however, keep in mind the fact that osteogenic sarcoma, Ewing's tumor, eosinophilic granuloma, and chronic osteomyelitis cannot always be excluded with certainty. (Wilson, T. W., Pugh, D. G., Primary Reticulum-Cell Sarcoma of Bone with Emphasis on Roentgen Aspects: *Radiology*, 65: 343-350, September 1955)

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Hypothermia in Surgery

This report is concerned with an analysis of the authors' experience with the first 100 patients whom they subjected to hypothermia, a deliberate physiologic adventure, with particular reference to its dangers and limitations as well as to its potential and actual usefulness in the attainment of operative objectives.

Because experimental interest has become widespread, seemingly contradictory physiologic data have been presented and, therefore, terminology is important. The authors define general hypothermia as the physical state of an homothermic individual in whom the body temperature is below the normal range for that individual. For man, therefore, with a normal range of 36° C. to 37.5° C. rectal temperature, any persistent temperature below 36° C would be accepted as representing a state of hypothermia. Obviously, the range of hypothermia is great.

The authors believe that, because hypothermia appears to have serious inherent risks and if pursued far enough inevitably results in death, the major aim of experimental effort should be directed toward

increasing their understanding of the relationship between the variables and the cardiac, circulatory, cerebral, hematologic, and metabolic tolerance to hypothermia; thus, deliberate control of such variables may be employed to increase the safety of the technique and expand its clinical utility. They believe also that a small beginning in this direction has been achieved. The present report describes their current thinking and practices in the effort to influence risk by the control of variables; how much remains to be elucidated will be evident.

The prime indication for the use of hypothermia in this series has been the desire to perform an operation in a bloodless field during temporary occlusion of the blood supply to or through the organ. Hypothermia was used as an agent to prolong the time-tolerance to ischemia and, thus, allow safe operating periods. That a low body temperature achieves this aim by its reduction in tissue metabolic rates has been clearly shown by many investigators and needs no elaboration. For this reason, all open intracardiac procedures and about half of the non-cardiac operations (cerebral and aortic) were performed during hypothermia.

A second indication has been to attempt to improve the operative risk in patients with congenital or acquired heart disease by achieving either better oxygenation of the patient (as in cyanotic cardiopathies) or slowing of the heart rate in severe tachycardia. In some instances, the authors were most pleased with the apparent effectiveness of hypothermia for this purpose.

A third indication was to explore hypothermia as a method of achieving hypotensive anesthesia in an effort to diminish operative blood loss without actual circulatory occlusion. A few patients with large visceral neoplasms were operated for this reason. However, the results were disappointing, in that, although operative hemorrhage was diminished, later ooze from unidentified vessels resulted in a total blood loss essentially undiminished.

The fourth and final indication used in this series was also an anesthetic one. Because hypothermia of sufficient degree is itself a potent anesthetic agent, it appeared possible that it might be less toxic to the individual than pharmacological agents, particularly under certain conditions. In patients who were facing prolonged and extensive procedures, or in whom there was hepato-cellular damage, cold might be less damaging than drugs.

Experience with 100 patients undergoing 105 operative procedures during general hypothermia is presented and discussed. Of these, 59 had direct vision intracardiac procedures, 21 had closed cardiac operations, while 20 had operations unrelated to heart disease. The total mortality was 22, the hypothermic-operative mortality, 14.

For achieving direct vision intracardiac operation, the technique is both effective and safe in congenital lesions which can be repaired through

a right heart approach with occlusion times of 8 minutes or less at body temperatures not lower than 26° C. The mortality rises sharply when these limits are exceeded. Extension of the technique to acquired lesions, or to those requiring left heart approaches, has not been explored. At present, the authors consider this the method of choice in the treatment of isolated valvular or infundibular pulmonary stenosis and of inter-atrial septal defect.

As a technique for reduction of operative risk in patients with congenital heart disease, characterized by deep cyanosis or by hypertrophied overactive hearts, the authors' impression was favorable. This technique may be less well tolerated or even non-beneficial in the presence of left heart strain. As a technique to allow temporary regional or organ ischemia to achieve a bloodless field, the method is both effective and quite safe.

In the human, acute hypothermia above 26° C., per se, appears to carry a very low risk provided many detailed precautions are observed. The prime cause of mortality is ventricular fibrillation and its sequellae. The risk of this complication exists primarily in patients with diseased hearts who undergo cardiac manipulation, and it rises progressively as more complicated, extensive, and prolonged operations on these hearts are attempted.

General hypothermia appears to be of sufficient safety and value to warrant further clinical evaluation and continued use. (Swan, H., et al., Hypothermia in Surgery - Analysis of 100 Clinical Cases: Ann. Surg., 142: 382-399, September 1955)

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Trigeminal Neuralgia

Trigeminal neuralgia, or tic douloureux, presents one of the most constant and classic syndromes in all medicine.

This syndrome is characterized by three features: (1) intermittent paroxysms of pain along the distribution of one or more divisions of the trigeminal nerve with complete freedom from the pain between paroxysms; (2) a unique "trigger mechanism" by which is meant that stimulation to the skin of the face or to the membranes of the mouth such as washing, shaving, drinking hot or cold liquids, eating rough foods, talking, or even smiling, will set off paroxysms of pain; and (3) a neurological examination with no abnormal findings. This unique triad is always produced by true trigeminal neuralgia and never by any other condition.

The cause of trigeminal neuralgia remains a mystery. The most careful studies of neuralgic nerves have never revealed any structural basis for the pain.

The course of untreated trigeminal neuralgia is remarkably constant. There may be temporary remission but pain always returns and always in more severe form and wider distribution than before. There is no spontaneous termination of the disease.

There are three well-established methods for treating trigeminal neuralgia. The first is by the inhalation of trichloroethylene, a highly volatile liquid closely related to chloroform. This will give relief to 5 or 10% of the patients.

The second standard method of treatment is by the injection of 95% alcohol directly into those divisions of the nerve that are giving rise to pain. This procedure is extremely painful and the relief afforded is only temporary. This relief lasts as a rule from 6 to 18 months after the first injection, but successive injections are always more difficult to accomplish and give shorter periods of relief; eventually, a time will come for each patient when alcohol will no longer relieve the pain.

The third method, and the one now generally accepted, is the intracranial section of the sensory root of the nerve. This can be done above the tentorium through the temporal approach or below the tentorium through the suboccipital approach. Both methods have good points, but at the Neurological Institute, the simpler temporal approach has proved to be satisfactory and is the method generally used. This operation can be performed entirely under local anesthesia or with the help of one of the new intravenous barbiturates such as thiopental sodium. The mortality rate after operations is only a small fraction of 1% despite the fact that many patients are 60 to 75 years of age or older, and often are considerably debilitated. Also, the postoperative morbidity is slight, the patients being out of bed as a rule on the first or second postoperative day and out of the hospital by the end of 5 or 6 days.

The relief of pain after sectioning of the nerve is immediate, complete, and permanent in all instances of true trigeminal neuralgia. The principal objection to the procedure is that the skin and mucous membrane, supplied by the divided nerve fibers, are permanently anesthetized after the operation, but the exchange of pain for anesthesia is as a rule easily accepted by patients who have been suffering with severe trigeminal neuralgia. Only in instances where operations have been performed ill-advisedly for facial pain which is not true trigeminal neuralgia, does this postoperative numbness of the face acquire importance. In such cases, the facial pain will not be relieved by the operation and the numbness will simply add a new complaint to the original one.

Facial paralysis, which is often feared by the layman faced with an operation for relief of trigeminal neuralgia, is a rare complication. When it does develop, it is usually not until the second or third postoperative day and, hence, cannot be the result of direct trauma to the nerve during

operation. The mechanism of this delayed palsy is not known. Fortunately, it is almost never permanent, spontaneous recovery usually taking place in a matter of weeks.

During the past year or so, two new operative procedures have been proposed that are claimed to relieve trigeminal neuralgia without leaving the skin and mucous membranes anesthetized. These operations are designed to "decompress" the trigeminal nerve at some point along its course where it is thought to be constricted. In one operation, the opening in the tenorium, through which the sensory root passes, is enlarged. In the other, the foramen, rotundum, and ovale, through which the second and third divisions of the nerve leave the skull, are enlarged. Although hoping that the claims made for these new operations will prove to be true, most neurosurgeons question their validity and feel that judgment must be reserved for the time being. (Scarff, J. E., Trigeminal Neuralgia: *J. Am. Dent. A.*, 51: 406-408, October 1955)

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Primary Carcinoma of the Ureter

Primary carcinoma of the ureter has always been considered a very rare disease but recent reports in the literature suggest that it should be changed from the rare to the infrequent class. The disease has apparently received little attention in the radiologic literature because the author has been able to discover only one reference in the radiologic journals. All other references were discovered in urological, surgical, or cancer journals, or in non-specialized publications. Therefore, it might be of advantage to radiologists to become better acquainted with primary carcinoma of the ureter.

Pathologically, primary cancer of the ureter is a carcinoma of the transitional type of epithelium found in other parts of the urinary tract such as the renal pelvis and the urinary bladder. The ureteral tumors can possess all the features of tumors in the renal pelvis and the urinary bladder. The neoplasms have a tendency to be multicentric in location and may be found widely separated in the urinary tract, but most often only localization is found. If situated low in the ureter, the tumor may grow downward and protrude into the bladder at the ureteral orifice so that it can be seen and biopsied cystoscopically. The tumor may be a solid pedunculated growth occluding the ureteral lumen, a sessile papillary carcinoma with invasion of the ureteral wall, or a diffuse papillary growth. The papillary growths can encircle the ureter to spread early, extensively, and quickly. The rate of growth frequently depends upon the degree of differentiation of the tumor. According to Soloway, metastases were found in 62% of reported cases; in order of frequency, these metastases

occurred in regional and distant lymph nodes, the liver, lungs, bones, kidneys, adrenals, spleen, brain, pancreas, and skin.

The tumor bleeds freely and causes varying degrees of ureteral obstruction. Dilatation of the ureter above the tumor, and hydronephrosis are frequent complications. Some of the more invasive tumors have been known to produce perforation of the ureter.

The tumors are found predominantly in the lower third of the right ureter in from 50 to 67% of cases, depending on the reporting author. Clinically, a symptomatic triad has been described as consisting of hematuria, pain, and a palpable abdominal mass. The most frequent symptom is that of bleeding which is often intermittent, ceases for no apparent reason only to recur, and is often painless, especially at the onset of the disease. The pain may be due either to the obstruction of the ureter with back pressure symptoms upon the upper urinary tract, or to direct invasion of the ureter. The abdominal mass is the distended hydronephrotic kidney.

Cancer of the ureter was found in patients 22 to 89 years of age. The greatest number is seen in the sixth and seventh decades and in 65% of cases, the male sex was afflicted.

The treatment of choice consists of a complete nephro-ureterectomy, preferably with removal of a cuff of bladder at the ureterovesical junction. The average survival time is 21.1 months. Preoperative and postoperative radiation therapy appear to be of no value.

The diagnosis of primary carcinoma of the ureter may be suspected from the clinical history. The typical case may be pictured as in a man, 60 years of age, with intermittent hematuria, pain in the flank of a continuous nature and a palpable mass in the renal area. The ultimate diagnosis, however, can be made much more probable by roentgenologic studies.

The differential diagnosis to be considered is that of nonopaque calculi, blood clots, benign ureteral stricture, ureteritis cystica, and ureteral tuberculosis. (Savignac, E. M., Primary Carcinoma of the Ureter: Am. J. Roentgenol., 74: 628-634, October 1955)

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Krukenberg Tumors: Diagnostic Problem

The term, "Krukenberg tumor," as used in this article, includes only those carcinomas of the ovary arising in the gastrointestinal tract and those signet-ring cell carcinomas primary in the ovary itself.

The age distribution for 468 women with Krukenberg's ovarian carcinoma is illustrated. Most were of reproductive age. The youngest was 13 years old and the oldest was 81. These extremes, however, were uncommon.

The average age of patients with the primary cancer in the stomach, colon, or rectum, was similar. Those with primary lesions in the gall-bladder or small intestine were, to the contrary, more often a decade older (fifth) than those with cancer of the stomach.

Pain and anorexia were the commonest complaints given by women with metastatic ovarian neoplasms. Pain, if present, was generally localized to the epigastrium in the patients with primary gastric cancer. Frequently, it was associated with either heartburn or a feeling of fullness. Tumor was the next most frequent complaint. Usually, it was the ovarian neoplasm that was felt and not the gastric growth. Commonly, symptoms began insidiously and were either so mild, negligible, or overshadowed by the pelvic disease, that little if any attention was given to the gastrointestinal disturbance. Hematemesis often was attributed incorrectly to a peptic ulcer.

Nausea, anorexia, loss of weight, constipation, or abdominal discomfort were the symptoms usually given by patients with primary carcinoma of the colon, cecum, rectum, and appendix. Those with the primary growth in the duodenum, pancreas, or hepatic system ordinarily suffered with epigastric discomfort, nausea, or loss of weight, or all three.

Anorexia, regardless of the location of the primary tumor, often antedated the correct diagnosis by several weeks or months. In the presence of pregnancy, it was generally attributed to hyperemesis gravidarum. In other instances, pregnancy was wrongly suspected because of nausea and vomiting.

Nearly 50% of the women with metastatic ovarian carcinoma of Krukenberg, where the duration of symptoms was known, had complaints less than 6 months, another 20% one to two years, and the remaining number, more than two years before consultation was obtained. This was true, regardless of the origin of the cancer.

Twenty-six women with Krukenberg's metastatic ovarian carcinoma were either pregnant or had given birth recently.

Detailed descriptions regarding the pathology of the Krukenberg tumors are available elsewhere. In this article, only the principal characteristics of the tumor are given. Grossly, this neoplasm is solid with an irregular smooth surface. Commonly, the cut section shows variegated areas—cystic, gelatinous, or hemorrhagic—intermingled with a firm to spongy framework. These cancers range from microscopic size to masses weighing several pounds. Four out of five are bilateral; the fifth is unilateral.

Microscopically, the structure of the tumor may differ from one part to another. The stroma may be cellular, edematous, or myxomatous. Epithelial cells may be arranged in true or false clusters. Often there are typical signet-ring cells. These may appear in any type of mucin-producing carcinoma. Mucification, therefore, does not necessarily indicate that the tumor arose in the gastrointestinal tract.

Metastases, determined by either exploratory laparotomy and/or post-mortem examination for patients with metastatic ovarian cancer, were most commonly found in the peritoneum, regional lymph nodes, mesentery, omentum, and pleura in the order named. In contrast, the substance of the liver was seldom involved. Generalized carcinomatosis was not common. Yet, occasional spread occurred to heart, bone marrow, brain, and skin.

The procedures employed to arrive at a correct diagnosis, in addition to a history and complete physical examination, are recorded for 237 women. A correct diagnosis is defined as establishing the site of the primary tumor as well as the presence of a Krukenberg ovarian metastases. Even with laparotomy, a correct diagnosis was often unestablished. Reports, however, do not indicate how many surgeons palpated the other abdominal viscera at the time of exploring part of the abdomen or pelvis.

The time interval between the diagnosis of the primary and secondary cancer or vice versa was available for 45 women. In two-thirds of them, there was an interval of 1 or more years compared to 1 to 12 months for the other third.

This study shows that, when the triad of persistent, sometimes almost negligible dyspepsia, anorexia with epigastric discomfort, and firm adnexal tumors is found particularly in a woman of reproductive age, metastatic ovarian carcinoma with a primary neoplasm of the gastrointestinal tract should be included in the differential diagnosis. Repeated roentgenographic studies of the gastrointestinal tract, gastroscopy, occasionally bimanual examination under anesthesia, exploratory laparotomy, or a combination of these procedures is required to confirm the diagnosis and to ascertain the origin of the neoplasm. Roentgenographic study, if depended on alone, may be misleading. Occasionally, the primary site may not be found until a careful post-mortem examination is done. The diagnosis of metastatic ovarian carcinoma of Krukenberg carries a grave immediate prognosis. This holds true even though a relatively small primary lesion of the gastrointestinal tract may be removed with the metastatic ovarian cancer. This poor prognosis probably rests with the fact that, by the time the ovaries are involved, spread in the lymphatic system is extensive.

The metastatic ovarian carcinoma of Krukenberg represents an advanced terminal phase of a neoplastic disease arising in the gastrointestinal tract. At this stage, treatment is usually only palliative. When peritoneal implants are widespread, it is apparent that radical operations, as presently done, are of questionable value. Under this circumstance, radical removal appears useless and justifiable only to relieve pressure symptoms, the occasional exception being those tumors arising in the large bowel. (Diddle, A. W., Krukenberg Tumors: Diagnostic Problem. *Cancer*, 8:1026-1030, September - October 1955)

Deferment of Professional Examinations

The Chief of Naval Personnel has approved the recommendation of the Chief of the Bureau of Medicine and Surgery to defer professional examinations for promotion of Medical Service Corps and Nurse Corps officers of the Regular Navy and Naval Reserve.

The authority for deferment becomes effective immediately and extends for the remainder of Fiscal Year 1956. Official notification of this subject will be promulgated by the Bureau of Naval Personnel in the near future. (TIO, BuMed)

* * * * *

New Postgraduate Course Offered to
Navy Medical Officers

Applications are desired from Regular Navy medical officers and Reserve officers who have recently reported to active duty for attendance at a course of instruction in Preventive Medicine to be conducted at the Naval Medical School, National Naval Medical Center, Bethesda, Md., commencing on 6 February 1956.

Purpose. This course is offered in order to better prepare medical officers for their service in the Navy. It will also serve to prepare eligible flight surgeons of the Navy and Air Force for examination by the American Board. The course is designed to assure knowledge of current principles and practices in preventive medicine at administrative and non-laboratory operational levels. Of primary concern are requirements of the military forces, their industrial activities, and their essential relationships with civil communities.

Length of Course. The course covers 18 weeks of lectures, laboratory and field observations, seminars and individual studies. Approximately 520 class hours are scheduled with time held in reserve for study and augmentation of individual subjects as found necessary.

Instruction Personnel. Highly qualified staff personnel, augmented by visiting lecturers from academic institutions, the Public Health Service, and the other Armed Services.

Course content includes the following:

- (a) Introduction to Biostatistics
- (b) Epidemiology

- (c) Environmental Preventive Medicine
- (d) Health Practice - general
- (e) Health Practice - specialized fields

Requests from interested and eligible personnel should be submitted via official channels to the Chief of the Bureau of Medicine and Surgery. Attendance will be on a temporary duty under instruction basis with travel and per diem provided. Enrollment is limited to 10 officers of the Navy plus 10 officers of the U. S. Air Force. Deadline for receipt of applications is 1 December 1955. Reliefs cannot be provided for those approved for attendance. (ProfDiv, BuMed)

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From the Note Book

1 The Secretary of the Navy approved the reports of the medical and dental officer promotion boards which recommended the temporary promotion of the following officers:

To Captain in the Medical Corps.....	283
To Captain in the Dental Corps.....	303
To Commander in the Medical Corps	381
To Commander in the Dental Corps..	149

Officers selected for promotion will be issued individual appointments when they become eligible in accordance with constructive service. (TIO, BuMed)

2 CDR Gioconda R. Saraniero, MC USN, is the first woman doctor to be selected for promotion to the grade of Captain in the Medical Corps of the U. S. Navy. She is presently on duty at the Infirmary, Headquarters Support Activities, Naples, Italy. (TIO, BuMed)

3 LT E. H. Gleason, MSC USN, was recently commended by the Operations Coordinating Board of which Herbert Hoover, Jr., was Chairman, for his participation in the United States Navy's operation "Passage to Freedom," during which the Navy moved 310,848 refugees from North Vietnam.

The Secretary of the Navy and the Chief of Naval Operations added their appreciation and hearty "well done" to that of the Chief of the Bureau of Medicine and Surgery for LT Gleason's performance in this most important role played by the Navy. LT Gleason, presently on duty in the Preventive Medicine Division of the Bureau of Medicine and Surgery, was serving

on additional duty as the Public Health Officer of the Medical Task Unit of Task Force 90.8.6 during the operation. His primary duty at the time was on the staff of Commander, Naval Forces, Far East. (TIO, BuMed)

4. LCDR J. L. McClung, MC USNR, U. S. Naval Hospital, Great Lakes, Ill., represented the Navy Medical Department at the World Congress of Anesthesiologists in Scheveningen, Holland, September 5 - 10, 1955. Doctor McClung presented a paper entitled, "Measurement of Mechanical and Electrical Events of the Cardiac Cycle. I. Ether Anesthesia," as a part of the Section on Physiology at the Congress. (TIO, BuMed)

5 LCDR Margaret S. Lincicome, MSC USN, became the second woman to be selected for promotion to the grade of Commander in the Medical Service Corps when her selection to that grade was announced by the Navy Department on October 11. (TIO, BuMed)

6 Class 76 of Naval Flight Surgeons was recently graduated at the Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. There was an international note to the graduation ceremony when representatives of three foreign countries received their certificates. LCDR Jorge B. Lopez of the Mexican Navy, LT Etienne Guibal of the French Navy, and SURG LT Norman W. Bradford of the Royal Canadian Navy received their designations as Naval Flight Surgeons after successful completion of approximately 600 hours of graduate medical training in the new specialty of Aviation Medicine and 6 weeks flight indoctrination in fixed and rotary wing aircraft. Each of the foreign graduates returned to his country to work in the field of Aviation Medicine. (PIO, School of Aviation Medicine, NAS, Pensacola)

7 A domestic water meter was coupled to a dental operating unit, the flush adjusted to sufficient flow, and water consumption measured for an eight-hour period. The water control device was then installed and the flow of water into the cuspidor was controlled by the patients for eight hours.

Calculations based on the water meter reading indicated that the dental operating unit without the control device used annually 108,247 gallons more water than with the device installed. Projected into annual water consumption costs, the uncontrolled dental unit used 110,518 gallons costing \$45.31; the same dental unit with the device installed used 2271 gallons costing \$0.93, a saving of 108,247 gallons costing \$44.38.

8 Thirty young Indians from 12 states have entered training at Phoenix, Ariz., to aid in sanitation work among their people. The course is part of a newly expanded program to improve health conditions among the American Indians and Alaskan Natives. After six weeks of intensive

training in sanitation and hygiene, the young Indians will be assigned to assist Public Health Service sanitary engineers on Indian reservations in Arizona, Colorado, Idaho, Minnesota, Montana, New Mexico, North Carolina, North Dakota, Oregon, South Dakota, Wisconsin, and Washington. (P. H. S., Dept. H. E. W.)

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"Good Leadership"

"I cannot help but take this opportunity to pass on to you a little personal advice and word of caution with regard to your present or future role as a hospital commander or administrator. During the next two weeks you will get the very best instruction and latest approved management methods and everything that goes to make an efficient hospital administrator from the management and fiscal standpoint. This is all good, but I see some familiar faces before me who I know have found out long ago that it takes more than this to make a successful hospital commander and a good hospital. The only reason for the existence of any hospital is the care of patients. The best possible medical care for each patient should be the primary concern of all. In addition to the professional care there must be good morale among patients and those who care for them. To accomplish this there must be real leadership, not dictatorship. Good leadership creates optimism and good human and personal relations. A famous physician once achieved results with a strange prescription. To one of his most irritable patients he gave a prescription blank upon which he had written, 'Say something kind to somebody—anybody—three times a day, and at bed time—especially at bed time.' The patient, finally convinced that the doctor was serious, agreed to try it. In less than a month his ulcers gave him no more trouble.

Show me a cold impersonal hospital commander or administrator who enjoys the solitude of his office and the accuracy of his slide rule and I will show you a mediocre hospital with poor morale regardless of its fine management and fiscal record. Three centuries ago, the great French philosopher Pascal wrote, 'Kind words do not cost much. They never blister the tongue or the lips. Mental trouble was never known to arise from such quarters. Though they do not cost much, yet they accomplish much. They might make other people good natured. They also produce their own image on men's souls and a beautiful image it is.' In your daily role as hospital commander or administrator don't neglect the human side for the business side. They are both very essential to the operation of any good hospital." (Major General William H. Powell, USAF (MC))

(The Surgeon General recommends that all Medical Department personnel read and practice the above.)

BUMED INSTRUCTION 5720.2A

26 September 1955

From: Chief, Bureau of Medicine and Surgery
To: All BuMed Management Controlled Activities
All Internal BuMed Codes

Subj: Newsworthy information concerning Medical Department personnel and activities

This instruction establishes a regular procedure for the transmission to the Bureau of all newsworthy information pertaining to functions and accomplishments of the Medical Department which are of general and/or special interest to the Navy and the public.

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BUMED INSTRUCTION 1910.2A

8 October 1955

From: Chief, Bureau of Medicine and Surgery
Chief of Naval Personnel
Commandant of the Marine Corps

To: COMs all NavTraCens; COs all NavHosp, CLUSA; COs all
NavRecStas, CLUSA; CGs and COs, all MarCorps Activities,
CLUSA

Subj: Disposition of enlisted and inducted members by reason of physical
disability or military unfitness; standards and procedures for

Ref: (a) Physical Standards and Physical Profiling for Enlistment and
Induction, Army Regulation No. 40-115 of 20 Aug 1948, as
amended
(b) Chapter 18, MMD
(c) Title IV of the Career Compensation Act of 1949 (37 USC
271-285)

Encl: (1) Certificate relative to full and fair hearing before a
Physical Evaluation Board

This instruction promulgates standards and procedures for the separation of subject members from the Naval Service who have become functionally incapable of performing useful service. BuMed Instruction 1910.2 of 21 May 1953 is canceled.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, 16 May 1955.



MEDICAL RESERVE SECTION

Naval Reserve Officer Schools

At the present time, approximately 72 Naval Reserve officer schools with an enrollment of over 9000 inactive Reserve officers are located throughout the continental Naval Districts.

Enrollment by schools ranges from 56 officers at Denver, Col., to 481 at San Francisco's Treasure Island. Enrollment is open to any inactive duty Naval Reserve officer in good standing in the Naval Reserve.

Courses available to Medical Department officers are Military Justice (2 semesters), Personnel Administration (1 semester), Leadership (1 semester), and Administration of Education and Training (2 semesters).

Naval Reserve officers who are members of another Reserve unit may enroll. In fact, many an officer student attends one night at a Naval Reserve officer school and one night at the drilling unit of which he is a member.

This program is essentially non-pay and is administered on the basis of an academic year of two semesters with classes held during September through June. Twenty drills a semester are scheduled (40 per year) and each officer must attend a minimum of 80% of the periods of instruction and successfully pass examinations given periodically and at the end of the course to complete the course satisfactorily. Both promotion and retirement points are credited to those who satisfactorily complete the courses. Fourteen days active duty for training with pay is available each year to all officers who are enrolled in Naval Reserve officer schools.

Schools are located in the following cities of Naval Districts:

First Naval District

Boston, Mass.
Lynn, Mass.
Salem, Mass.
Worcester, Mass.
Portland, Me.
Providence, R.I.

Third Naval District

New Haven, Conn.
Clifton, N.J.
Elizabeth, N.J.
Albany, N.Y.
Buffalo, N.Y.
Freeport, N.Y.

(continued)

Huntington, N.Y.
New York, N.Y.
Fourth Naval District
Cincinnati, Ohio

Fourth Naval District

(continued)

Cleveland, Ohio
Columbus, Ohio
Toledo, Ohio
Pittsburgh, Pa.
Villanova, Pa.

Fifth Naval District

Louisville, Ky.
Baltimore, Md.
Norfolk, Va.
Richmond, Va.

Sixth Naval District

Coral Gables, Fla.
Miami, Fla.
Tampa-St. Petersb'g, Fla.
Atlanta, Ga.
Durham, N. C.
Winston-Salem, N. C.
Columbia, S. C.
Knoxville, Tenn.

Eighth Naval District

Little Rock, Ark.
Baton Rouge, La.
Lafayette, La.
New Orleans, La.
Shreveport, La.
Albuquerque, N. M.
Santa Fe, N. M.
Oklahoma City, Okla.
Tulsa, Okla.
Amarillo, Tex.
Austin, Tex.
Beaumont, Tex.
Corpus Christi, Tex.
Dallas, Tex.
El Paso, Tex.

Eighth Naval District

(continued)

Fort Worth, Tex.
Houston, Tex.
Midland, Tex.
San Antonio, Tex.

Ninth Naval District

Denver, Col.
Detroit, Mich.
Forest Park, Ill.
Evanston, Ill.
Minneapolis, Minn.
St. Paul, Minn.
Kansas City, Mo.
St. Louis, Mo.
Madison, Wis.
Milwaukee, Wis.

Eleventh Naval District

Los Angeles, Calif.
Ontario, Calif.
San Diego, Calif.

Twelfth Naval District

Fresno, Calif.
Sacramento, Calif.
San Francisco, Calif.
San Jose, Calif.
Salt Lake City, Utah

Thirteenth Naval District

Portland, Ore.
Seattle, Wash.

PRNC

Washington, D. C. (Naval Gun Factory) and Alexandria, Va.



PREVENTIVE MEDICINE SECTION

Influenza Vaccination - 1955

Influenza vaccine will be administered to all naval personnel on active duty in the autumn months of 1955. For optimum results, this immunization should be performed prior to the season of highest respiratory disease incidence. November 15 has been set as a desirable target date by which to have all influenza vaccinations completed. This season, the influenza vaccination will also be offered on a voluntary basis to two additional groups, i. e., dependents of service personnel on active duty and civilian employees and their dependents who are located at overseas bases and whose medical care is the responsibility of the Navy. Immunization of dependents is desirable because studies have shown that school age children are more susceptible to influenza than are adults and are often the source of infection of their parents. Adults and children, eleven years of age and older, will receive one subcutaneous injection. Younger children will be given two or three smaller injections at weekly intervals. Infants of less than one year will not receive this immunization. Individuals who have any history or suspicion of sensitivity to eggs, chickens, or feathers should not be given this vaccine as it is a chick-embryo-prepared virus vaccine and even the slightest traces of chicken protein could precipitate an anaphylactic episode in them. It is very important to guard this vaccine against freezing and also against excessively warm temperatures. It keeps best when stored at temperatures ranging between 35° to 50° F. (2° to 10° C.) However, it may be shipped safely without refrigeration, providing that it is not permitted to freeze and is not exposed to temperatures exceeding 100° F. for too long a time.

The vaccine contains a small amount of formalin, and as is frequently true with formalin killed vaccines, an immediate stinging sensation may be noticed following its injection. Also, there may be a small amount of muscle soreness localized at the site of injection; however, these are minor complaints and are not considered to be unfavorable reactions to the use of this vaccine. Prior to initiation of the influenza vaccine immunization program

in the fall of 1954, numerous inquiries were made about reactions to the vaccine. Because of this, the five centers at which naval recruits are trained were asked to provide the Bureau of Medicine and Surgery with a special letter report on the incidence of reactions causing loss of time from duty. The reports are summarized in tabular form as follows:

Station	Inoculated	Admitted with reaction	Sick days (average)	Anaphylactic & other reactions
NTC, Great Lakes	14,351	5	1.6	None
NTC, San Diego	24,976	23	2.0	None
NTC, Bainbridge	28,019	5	4.8	2*
MCRD, San Diego	9,230	4	1.8	None
MCRD, Parris Island	(unstated)	.0049%	1.0	None

* Both were in individuals, sensitive to eggs, and who avoided being questioned prior to vaccination.

Last year's experience demonstrated that minor local reactions occurred in a high percentage of individuals receiving this vaccine; however, little incapacitation was associated with these local reactions, and more severe generalized reactions occurred in a very small percentage of men.

During the past several years, NMRU#4 has conducted studies on influenza including evaluation of influenza vaccines. These studies have been accomplished under the authority of approved research projects and in collaboration with the Commission on Influenza of the Armed Forces Epidemiological Board. The studies have been of considerable importance in determining the need for and results of vaccination. Additional projects on influenza are contemplated by NMRU #4 for the current winter season which will be of value in charting the influenza vaccination program of the future.

It is anticipated that this vaccine will effect a substantial savings in money and manpower to the Navy through better health this coming winter. (LT John F. Egan, MC USN, PrevMedDiv)

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Influenza Vaccine Variation

The color and general appearance of influenza vaccine may vary from one manufacturer to the next. One vaccine may have the color and appearance of apple cider, whereas, that of another manufacturer may be a cloudy

white. However, all vials of this vaccine with the same lot number should have the same appearance. Methods of harvesting the amniotic fluid from the eggs and other individual details of manufacturing produce products with varying physical appearances but similar antigenic protective properties.

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Effectiveness of Polio Vaccine

The quotation below is taken verbatim from the speech of Dr. Leonard A. Scheele prepared for presentation at the Economic Club of Detroit, Monday, October 3, 1955. The statement is released for publication as of that time.

"The children vaccinated last year and this year are the center of what is probably the largest mass study of vaccine effectiveness in the history of public health. The Poliomyelitis Surveillance Unit of the Public Health Service, with headquarters at our Communicable Disease Center in Atlanta, Georgia, is serving as a clearinghouse for a nation-wide study to determine the effectiveness of poliomyelitis vaccine as used this year, and to report the experience of children vaccinated in the field trial. All state and territorial health departments and more than 30 laboratories are participating in the study.

The results of this year's use of poliomyelitis vaccine cannot be stated precisely at the present time. The 1955 polio season now is just past the half-way mark, so we have only part of the returns on this season's occurrence of polio throughout the nation. There is always some lag in reporting and many weeks are needed to verify diagnoses and to determine the extent of paralysis in reported cases. We cannot compare this year's results precisely with the results of the 1954 field trial in which the children received three injections and a control group was set up by giving some children "placebo" shots.

At present, we have only partial preliminary reports. On that basis, we cannot draw final conclusions. But I am happy to say that our first "returns" are very encouraging.

Dr. Alexander D. Langmuir, who is in charge of the Public Health Service study I referred to, and Doctors Neal Nathanson and William J. Hall, members of his staff, have prepared for me a sort of "box-score" to date. Here it is:

1 The number of reported cases of poliomyelitis, paralytic and non-paralytic, among the 7 million vaccinated children throughout the United States is now running 25 to 50% below the incidence expected without vaccination in the same age groups.

All states and territories are participating in this part of the study. During the first month or two following injections, about as many cases were reported in vaccinated children as were expected. But after the second month the frequency was substantially lower. Also, strong evidence of lessened severity became apparent after the second month when reported cases among vaccinated children became predominantly non-paralytic.

2 Special studies are being carried out in nearly half of the states to measure the poliomyelitis experience of all children 5 - 10 years of age. Early reports from six areas show that paralytic attack rates among vaccinated children are strikingly lower than among unvaccinated children of the same ages. In almost all reporting areas, these reductions are 50% or greater.

3 In 29 states, where incidence has been measured by individual years of age, the trend is toward distinct reductions in the incidence of paralytic polio among those age groups which include vaccinated children.

Preliminary analyses, based on reports of 2539 paralytic cases in all age groups, already show a distinct lowering of the incidence of paralytic polio in 8-and 9-year-olds, and a small reduction in 7-year-old children. This early evidence is significant because the use of poliomyelitis vaccine has been restricted this year chiefly to these age groups.

4 In epidemic areas, particularly in New England and Wisconsin, the infrequency of paralytic cases among vaccinated children is notable. Especially intensive studies are being conducted in these states. In these high-incidence areas, the immunity of vaccinated children has been put to the most severe test. It is expected that these studies in epidemic areas will provide the most definitive evidence regarding the effectiveness of the vaccine this year.

5 The number of paralytic cases among children vaccinated in the 1954 field trial, with or without "booster" shots this year, is too small for evaluation as yet. The rarity of paralytic cases in this group, however, is outstanding so far.

I want to remind you again that these results are tentative. They are based on preliminary, and as yet incomplete, reports of the experience of children in limited age groups. But there is little likelihood that we shall see any major departure from the favorable trends I have reported among vaccinated children, although the precise rates may change. We will eagerly await the final scientific evaluations in 1956.

It is difficult, however, not to be very optimistic about the value of the vaccine as used this year. The reports are all the more encouraging because the vast majority of these children have had only one injection instead of the three injections received by children vaccinated in the 1954 field trial. It is reasonable to expect even greater protection when the full course of immunization has been completed.

The prospects are indeed bright for the effective control of paralytic poliomyelitis in the nation in 1956 and the years ahead. All that we know today justifies going forward as rapidly as possible with our vaccination program."

(Langmuir, Alexander D., M.D., Chief, Epidemiology Branch, Communicable Disease Center, P.H.S., Dept., H.E.W., Special Memorandum, October 3, 1955)

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JP-4 Jet Fuel in Eyes

The following article may prove useful to naval activities using jet fuels:

During the past month, the Naval Air Station, Columbus, Ohio, requested the Naval Fuel Supply Officer, Washington, D. C., to supply information concerning the chemical content of the jet fuel JP-4. The information was sought for use in the treatment of personnel whose eyes may be splashed accidentally with the fuel, and also in the establishment of a program for the prevention of such accidents in the handling of the fuel.

JP-4 fuel consists essentially of a straight run petroleum fraction, boiling between 150° F. to 500° F. Ordinarily it contains 10% to 18% aromatics and 20 parts per million of corrosion inhibitor, santolene. Santolene is essentially 50% kerosene and 50% dilinoleic acid with a controlled minor amount of amyl phenol partial ester of phosphoric acid. The petroleum fraction consists of a combination of kerosene and gasoline; if splashed into

the eye and allowed to remain there, these compounds may cause a severe inflammatory reaction. The santolene portion of subject fuel would also produce a severe inflammatory reaction if allowed to remain in the conjunctival sac. Undiluted santolene placed in a rabbit's eye and allowed to remain there produced considerable irritation. No permanent damage to the rabbit's eye tissues was noted, according to information received from the Monsanto Chemical Company.

JP-4 fuel, if splashed into the eyes, produces smarting and burning which is a typical reaction to petroleum products in general.

Treatment should consist of immediate on-the-spot thorough flushing of the complete conjunctival sac with copious amounts of plain water. This procedure should be continued until it is certain that all of the fuel has been removed. Following this, the patient should be taken to the nearest medical facility, if he is not already there, for examination and treatment by a medical officer.

In areas where men are exposed to potential splashes from JP-4 fuel, personnel should be provided with, and required to wear, approved eye-protective equipment.

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Potable Water in Ships' Tanks

It has come to the attention of the Bureau of Medicine and Surgery that in some instances water in ships' tanks has been condemned as not being potable on the sole basis of a high standard plate count despite a negative coliform count. Experiences of Preventive Medicine Units in judging the quality of a ship's drinking water have revealed that there is not sufficient evidence to warrant the assumption that standard plate counts are significantly related to possible contamination of the water in the tanks with pathogenic bacteria. On the contrary, it has been proven that in warm weather saprophytic bacteria can and do multiply to levels that often exceed bacteriological standards set forth in official publications.

It is recommended that a ship's water tanks with high plate counts and negative coliform counts be neither considered unsafe nor counted in any series that purports to show drinking waters in naval vessels as unsatisfactory. However, if doubt ever exists as to the potability of any water supply afloat, chlorination is recommended and should be accomplished immediately, as chlorination will salvage tanks of water previously condemned as unsuitable.

The methods for the determination of standard plate count of water supply ashore will be retained in current directives as an optional procedure. The standard plate count of shorewater supply is considered a good indicator of the quality of water, and in particular, is useful in determining the efficiency of various water treatment methods.

Sanitary Precautions in the Handling and
Manufacture of Ice

Observations in the field have pointed out the need for uniform guidance in the health aspects of the manufacture and handling of ice. This information is particularly important when ice is purchased from commercial concerns because laws in many state and local governments do not consider ice a food or food product until such time as it reaches the food-service establishment or consumer. Consequently, ice may not come under regulatory control of the local or state health departments until such time as it enters the food-service establishment.

Because most plants assure themselves of a safe water supply, contamination of ice is generally the result of: (1) insanitary manufacturing routines at the plant, or (2) handling practices while en route for delivery.

The following precautions should be observed:

1 The water supply should meet the same bacteriological and chemical standards set forth for drinking water in the Preventive Medicine Laboratory Methods Manual.

2 Machines and equipment utilized in the manufacture, processing, and handling of ice should be kept scrupulously clean at all times. Prior to each period of use, each part of the equipment with which ice comes in contact, should be sanitized with a 200 ppm chlorine solution.

3 Health standards applicable to other food-service personnel should be applied to personnel manufacturing and handling ice. Street clothing should not be worn in the plant, and clean, washable footwear should be used at all times in the pulling and handling areas.

4 Ice should be stored in a room of satisfactory construction, preferably one with easily removable flooring, such as duckboards. If foods are stored in the same room, they should be stored off the floor and should neither come in contact with the ice nor be stored overhead where they might drip or spill to contaminate the ice beneath.

5 Wagons, trucks, and other vehicles used for delivery of ice should be maintained in a clean and sanitary condition and should be completely covered to protect the ice during transit. The inside flooring and body of vehicles should be washed daily, or more often if necessary, to maintain the surfaces in a sanitary condition. When the ice must rest on the floor of the truck, duckboards should be provided.

6 Cake or block ice should be handled with tongs, and processed ice, in sanitary bags. Block ice should be cut in the plant to cakes not over 75 pounds in weight to simplify handling and storage. Ice should not be left on the street, sidewalk, dock, et cetera, during delivery, unless it is protected in a sanitary manner and then cleaned thoroughly prior to use.

7 Ice to be ground or crushed should be thoroughly washed with potable water prior to being placed in the grinder or crusher. The grinder or crusher should be located in a satisfactory covered structure protected from airborne contamination. The containers used for delivery of the ice should be clean and sanitary and should be kept covered during delivery. If canvas containers are used, they should be washed and sanitized thoroughly after each use. The crushing or grinding of ice on trucks or wagons should be strictly prohibited.

8 Cubed ice should conform to the standards for other ice. Chlorination of block, cubed, or flake ice with a 2 to 5 ppm available chlorine, introduced into the potable water used in the manufacture of the ice, is recommended to reduce bacteria and coliform counts and to act as a safeguard against contamination introduced by poor processing and handling techniques. The same routine bacteriological examinations as those prescribed for potable water should be accomplished. Cleanliness should be observed at all times while collecting and transporting samples.

The belief that bacteria are destroyed by freezing is disrupted by the fact that many bacteriologists have found in their research that disease-producing bacteria can survive for long periods in ice. In fact, freezing is now a common method of preserving cultures of some micro-organisms in many laboratories.

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Comparative Vascular Pathology of Occupational Chest Diseases: Preliminary Observations

Both the autopsy and biopsy findings in the lungs of persons who had been adequately exposed to industrial dusts, including quartz, iron, coal, talc, gypsum, diatomaceous earth, beryllium compounds, and asbestos, either singly or in combination, showed a diversity of lesions of blood vessels whose prevalence and extent varied according to the nature of the foreign substances deposited in the lungs, their quantity, and associated infection. The most pronounced effects were on the smaller vessels and comprised cellular and collagenous lesions of the capillaries in the alveolar

walls, damage to the intima, muscular coats, and adventitia of the arterioles and venules, and perivascular deposits of pigments, fibrocytes, and macrophage with variable degrees of associated fibrosis. The effect on these small vessels may be to occlude, stenose, and distort them and to create inefficient vascular short circuits. Larger pulmonary vessels may also show damage ranging from intimal atheroma to medial segmental hypertrophy and collagen degeneration, cicatrical stenosis, and aneurysmal distention. Such vessels may become eroded and rupture. Exploration of the relationship between the silicotic nodule and the vascular system revealed that in silicosis, the vascular damage is an added lesion over and above the specific collagenous nodules which later may show their own peculiar vascular degenerative phenomena. In anthracosis, siderosis, berylliosis, talcosis, and asbestosis, the perivascular lesion proved to be an integral and indistinguishable component of the pathognomonic pulmonary dust lesion. Specific dust particles or fibers and even asbestos and tremolite bodies may, in most instances, be demonstrated within or in relation to these vascular lesions. In the presence of superimposed infection, particularly tuberculosis, the vascular damage may be disproportionately great. This effect was found to be enhanced if there was associated quartz inhalation. Asbestosis was not observed to follow these rules directly. It is suggested that these vascular changes may be a factor in the genesis of cor pulmonale, though it is not at present established that they may bring about this result in the absence of associated physiological disturbances leading to anoxia. (Schepers, G. W. H., Comparative Vascular Pathology of Occupational Chest Diseases: Preliminary Observations: A. M. A. Arch Indust. Health, 12: 7-25, July 1955)

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The Value of Lung Biopsy in Diagnosing Occupational Pulmonary Diseases

In 26 of 66 patients, on whom surgical lung biopsy was performed in the course of the past 5 years at the Cleveland Clinic, a question of occupational disease arose on the basis of history, roentgenologic findings, or a combination of the two. In 11 of the 26 patients, the lung biopsy finally proved a diagnosis of an occupational disease, i. e., asbestosis in 1 patient, siderosis in 1, silicosis in 3, and berylliosis in 6. The cases of 2 of these 11 patients that are representative of all of them are reported in detail. In contrast to these 11 patients, a presumptive diagnosis of occupational disease was disproved by lung biopsy in the remaining 15 patients; presumptive diagnosis had been based on suggestive exposure history in 3; on suggestive roentgen-ray picture in 6; and on suggestive exposure history and roentgen-ray picture in the remaining 6. Three cases,

illustrating each of these three categories, are reported. Surgical lung biopsy is a direct approach to the diagnosis of diffuse pulmonary disease in patients in whom routinely used studies fail to establish an accurate diagnosis. This is a particularly important procedure in borderline cases in which it is otherwise impossible to prove or disprove the presence of an occupational disease. (van Ostrand, H. S., Effler, D. B., McCormack, L. J. Hazard, J. B., The Value of Lung Biopsy in the Diagnosis of Occupational Pulmonary Diseases: A. M. A. Arch. Indust. Health, 12: 26-32, July 1955)

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Eyesight Saved by Safety Spectacles

The Norfolk Naval Shipyard Industrial Health Data Sheet Report (NavMed 576) for July 1955 contained the following:

"TJN, trackman, and three other employees were breaking concrete with jack hammers. The men had just started to break the concrete when a piece approximately one inch in diameter flew up from the tip of one of the chisels and struck the left lens of TJN's safety spectacles with enough force to shatter the lens. He is confident that he would have sustained severe eye injury, possibly loss of sight, had he not been wearing safety spectacles."

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